

scaffolds

Update on Pest Management
and Crop Development

F R U I T J O U R N A L

March 23, 2009

VOLUME 18, No. 1

Geneva, NY

WHITE OUT

COLD RE-BOOT
(Art Agnello,
Entomology,
Geneva)



❖❖ There's a big white birch tree on the lawn across the street outside of my office window. Even though it's really quite large and majestic, probably more than 30 ft tall, I rarely ever notice it except right at this time of year, because that's when it tends to stand out. During the winter, all the surroundings are similarly white, so it blends in with the rest of the landscape, and in summer, it gets obscured by its own foliage and that of the trees around it. It's only near the end of March, when things are starting to show a little color but no leaves have come out yet, that it emerges as the brightest thing in view, as if a light were being shined on it. This also happens just at the same time we're starting up again with this newsletter, so it becomes the alert signal that catches the eye and reminds us where attention needs to be directed now. After a winter that was respectable by anyone's measure, it'll be good to start thinking in terms of the growing season again.

It ain't who you know, it's who you can get to return your calls

This month's earlier email test message produced only a couple of requests for address changes, and no dead-end transmissions, so either everyone on this list has installed aggressive spam filters or else most of you are still with us despite the intervening 6 months of political and economic drama. We do encourage you to inform us of any address changes, so that

there are no subscription interruptions; if we don't hear from you (or get only error messages when we email), we won't know where you are. As before, Scaffolds will be offered only via email and the web, formats that tend to be the most compatible with current budgetary realities.

We will again be sending Scaffolds out as a pdf file via email each Monday afternoon. For those desiring a more screen-friendly format than the double column we currently use, I am willing to send an unformatted plain text version to anyone who requests it, in addition to or in place of the pdf. So far, there is still also a web version available from the NYSAES server, which is normally up by Tuesday or Wednesday each week, at: <http://www.nysaes.cornell.edu/ent/scaffolds>.

continued...

IN THIS ISSUE...

GENERAL INFO

CHEM NEWS

- ❖ Product registration update

DISEASES

- ❖ Fungicide supply complications
- ❖ Reduce scab inoculum now

INSECTS

- ❖ Brown marmorated stink bug

PHENOLGIES

PEST FOCUS

UPCOMING PEST EVENTS

As always, we are happy to consider contributions (particularly from N.Y. sources) in the form of articles on topics in any of the fruit crop protection or crop production areas, as well as N.Y. field observations, trap data, etc.

EVENTS REMINDERS

In-Depth Fruit School on Apple Mineral Nutrition

Cornell University is organizing a one-day in-depth fruit school on apple mineral nutrition at two locations in NY on March 24 (Ballston Spa, Saratoga Co.) and March 25 (Newark, Wayne Co.). The web site for information is:

<http://hort.cals.cornell.edu/cals/hort/news-events/upload/2009applenutschool.pdf>

Worm Workshop – Keep Codling Moth and Oriental Fruit Moth Out of Your Fruit

March 31, 8:30-noon, Wayne Co. CCE, Newark, NY. Featured speaker, Peter McGhee, Michigan State University. Topics include:

- Identification and Biology of Codling Moth and Oriental Fruit Moth – D. Breth
- How to Use New and Old Insecticides to Control these pests – A. Agnello
- Does the DD model Work for all? – D. Breth
- Implementing Mating Disruption, Who should use it, and how? – Peter McGhee
- Where do Viruses fit? – Peter McGhee
- Comparison of grower programs with and without mating disruption – W.H. Palmer
- Keeping costs down – D. Breth, A. DeMarree
- See the real worms, moths in traps, etc.

Registration fee is \$15, (\$30 for growers not enrolled with CCE in fruit) to cover cost of program, handouts, and refreshments. [But if you received a letter from Deborah Breth reporting the identification of larvae found in infested truckloads of apples, and returned the completed questionnaire that was enclosed with the letter, registration is free.] It is not too late to send in the information.

To register: call Kim Hazel at 585-798-4265 x26, or email her at krh5@cornell.edu

Effective Spraying of Orchards – Workshop

- April 2: 9 AM-4 PM, Wayne Co CCE, 1581 Rt 88N, Newark NY
- April 9: 9 AM-4 PM, Orleans Co CCE, 12690 RT 31, Albion, NY

If you have a key employee on your farm that you want to increase their skills in managing the sprayer, this is the same workshop funded by NY Farm Viability Institute last year, taught by Dr. Andrew Landers. There are still seats left in the 2 workshops. There is a limit of 15 seats per session. The cost per person is \$15, for lunch, manuals and refreshments.

Approximately 5.5 DEC Recertification Credits available for certified applicators. Call now to make your reservation by calling Kim Hazel at 585-798-4265 x26. Please RSVP by March 27, 2009. ❖❖

scaffolds

is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
 Dept. of Entomology
 NYSAES, Barton Laboratory
 Geneva, NY 14456-1371
 Phone: 315-787-2341 FAX: 315-787-2326
 E-mail: ama4@cornell.edu

Editors: A. Agnello, D. Kain

This newsletter available on CENET at: [news://newsstand.cce.cornell.edu/cce.ag.tree-fruit](http://newsstand.cce.cornell.edu/cce.ag.tree-fruit) and on the World Wide Web at:

<http://www.nysaes.cornell.edu/ent/scaffolds/>

A
LISTPRODUCT
REGISTRATION
UPDATE

(Art Agnello, Entomology,
Geneva, and Deb Breth,
CCE Lake Ontario Fruit
Team, Albion)

Label Changes

- The use of Guthion/azinphosmethyl products this year continues to change slightly from its previous rates, in accordance with the scheduled phase-out guidelines previously established by EPA. In apples, a total of 6 lb formulated product/A is allowed in 2009, the same as last year; this will go to 4 lb/A in 2010, and 3 lb/A in 2011–2012, before being completely phased out. In pears, however, the rate is reduced to 4 lb formulated product/A for 2009. In 2010–2012, it will be at the same total rates as in apples. In cherries, it's 3 lb/A in 2009, and 1.5 lb/A in 2010–2012. Recall that there is now a 60-ft buffer required from permanent bodies of water and occupied buildings, and a PHI in Pick-Your-Own operations scaled from 33–44 days, according to use rate. Read your labels carefully. These products had been previously excluded from use on peaches, nectarines, plums, prunes, and apricots.

- Kelthane registrations expired in 2008, so this product has been deleted from the guidelines.

New Labels

Some new products added to the 2009 NY Pest Management Guidelines for Commercial Tree Fruit Production [the web version of the Guidelines will be available soon] include:

- Beleaf (FMC) insecticide, EPA Reg. No: 71512-10-279
- Casoron CS (Chemtura) herbicide, EPA Reg. No: 400-541 [See below for details]
- Chateau (Valent) herbicide, EPA Reg. No: 59639-99
- Delegate (Dow AgroSciences) insecticide, EPA Reg. No: 62719-541

- Gramoxone Inteon (Syngenta) herbicide, EPA Reg. No: 100-1217 [See below for details]
- Leverage (Bayer) insecticide, EPA Reg. No: 264-770
- Prowl H2O (BASF) herbicide, EPA Reg. No: 241-418 [See below for details]
- Rage (FMC) herbicide, EPA Reg. No: 279-3307 [See below for details]
- Venue (Nichino) herbicide, EPA Reg. No: 71711-25 [See below for details]
- Warrior II (Syngenta) insecticide, EPA Reg. No: 100-1295

Herbicide Update Details

Casoron CS (dichlobenil, 1.4 lb/gal) is a liquid formulation of Casoron, registered in NY as of July, 2008. Casoron is a broad spectrum pre-emergent herbicide effective in the control of most annual and perennial grasses and broadleaf weeds. It is a water-based, microencapsulated herbicide that infiltrates the soil surface, where the microcapsules are broken down, releasing the herbicide to absorb to the organic matter in the soil. The best application timing is late fall through early spring and when temperatures are below 70°F, and weed seedlings are less than 2 inches tall. Do not apply to very sandy soils, and avoid spray drift, since non-target plants can be injured. In apples, blackberry, blueberry, cherry, grape, pear and raspberry: apply 1.4 to 2.8 gallons/acre tank mixed with a post-emergent herbicide. Use only on well established plantings – do not apply until 1 year after transplanting. In blackberry and raspberry, do not apply during new shoot emergence. It has a 24 hour REI, but no PHI listed on the label.

Chateau WDG (flumioxazin) is an herbicide with pre-emergent and post-emergent activity. It provides residual control and will also enhance the activity of the burndown program with glyphosate or paraquat. It is readily absorbed by leaves, and quickly causes bleaching and wilting of weeds. It is effective for post-emergence control of many broadleaf weeds while they are small, 2–6 inches

continued...

high, depending on the weed species. It is also an effective pre-emergent control of many broadleaf weeds and grasses.

Chateau has been registered for use in non-bearing tree fruit since 2006. It was registered in NY for bearing pome fruit, stone fruit, strawberries and blueberries in October, 2008. This is a supplemental label with several restrictions and limitations on its use; it must be in the applicator's possession at the time of use. The supplemental label for tree fruit limits applications to a maximum of 12 oz/A per application, with a maximum of 24 oz/A during a 12-month period, and no sequential applications within 30 days after the first application. If the soil is sandy or gravelly (over 80% content), a maximum rate of 6 oz/A should be applied in trees established for less than 3 years.

In apples, applications must be made between final harvest and pink bud; in stone fruit and pear, between final harvest and budbreak. Do not apply to trees established less than 1 year, unless protected from spray contact with non-porous tree wraps, grow tubes, or waxed containers. Do not apply within 300 yards of non-dormant pears.

The label also includes several precautions related to dust and sandy soil blowing into the tree after application, which can result in burning of leaf and fruit tissue. Chateau has worked very well in demonstrations using a tank mix with Prowl H2O and glyphosate, or other post-emergence herbicides such as paraquat, 2,4-D, or Rely. Do not apply within 60 days of harvest. Chateau has 12 hour REI.

Prowl H2O (pendamethalin) is a meristematic inhibitor that interferes with cell division required for plant growth. The H2O formulation is registered for use in bearing and non-bearing pome and stone fruit in NY. This is not the formulation of pendimethalin (Prowl 3.3 EC) that is registered in nonbearing trees only. It should be applied at 2–4 qt/A. It is effective for pre-emergent control of many grasses as well as some broadleaf weeds

such as pigweed and lambsquarters. Currently, only Prowl 3.3 EC is listed in the Guidelines as an option for nonbearing tree fruit only. Prowl H2O has a 24 hour REI and 60 day PHI.

Gramoxone Inteon (paraquat) is a 2 lb/gal formulation that has been formulated to prevent acute toxicity of the herbicide. Gramoxone Max (3 lb/gal formulation) is no longer labeled for use in NY. The rate for Gramoxone Inteon is 2.5–4.0 pt/A compared with 1.7–2.7 pt/A for Max. Gramoxone Inteon is registered for use in all the same crops as Gramoxone Max. There are two generic products like Gramoxone Max now registered, including Firestorm and Parazone 3SL – they are both 3 lb/gal materials. There are differences in safety precautions, first aid, and PPE requirements among these products.

Rage is a premix of 0.04 lb/gal of carfentrazone-ethyl (the same a.i. as in Aim) plus 5 lb/gal glyphosate, marketed by FMC. It is registered for use in NY in tree fruit, grapes, cane berries, bush berries. Do not use in stone fruit (cherries, apricots, peaches, plums, prunes) from budburst until after harvest. Refer to label for use rates for controlling specific weeds. Include a nonionic surfactant for best control. Remember that Aim will cause some burning if it contacts foliage and fruit, and glyphosate precautions apply. It is also newly registered in berry crops. The label also allows for “chemical mowing” but read and follow all label restrictions.

Venue (pyraflufen ethyl) is a nonselective contact herbicide for post-emergence control of broadleaf weeds in tree fruit and vine crops. It resembles the same mode of action as Aim, as it speeds the burndown of weeds. It is registered for use in both bearing and non-bearing tree fruit. It works best if weeds are small, i.e., 2–4 inches; control will be better in larger weeds if tank mixed with 2,4-D or glyphosate. The label restricts usage to postharvest to pre-bloom season only.

continued...

Generics: Although there are several generics of most of the herbicides in the Tree Fruit Guidelines, it is impossible to include them all in this publication. It will be important if you are purchasing generic herbicides to double check the particular product by EPA number to see if the material actually is labeled for use on your intended crop in NY: <http://magritte.psur.cornell.edu/pims/current/>. Take some time to read the label to determine what adjuvants are recommended for best control, including the addition of ammonium sulfate or non-ionic surfactants (NIS).

tion facility was shut down. Penncozeb and Manzate contain the same active ingredient and should be available so long as the just-in-time delivery schemes don't hit any snags.

Supplies of Pristine and Inspire-Super may be limited in some locations. Inspire-Super is a new DMI-containing fungicide that is not yet registered in NY, but Syngenta hopes to have a New York registration soon.

Fungicide pricing: Prices for mancozeb fungicides (Penncozeb, Manzate) have more than doubled in the past year, and the cost of captan has also increased significantly. Prices for the strobilurin fungicides (Sovran and Flint) have reportedly softened a bit.

Contributing factors: I won't even attempt to sort out which factors are the most important contributors to the fungicide supply issues, but all of the following have been mentioned and are probably playing a role:

- Some older manufacturing facilities are being decommissioned for various reasons (e.g., the plant that made Dithane).
- Increased raw material prices (high oil prices last summer) necessitated higher pricing. Many generic products such as the mancozeb fungicides had such low profit margins that any economic disruptions in raw material pricing, labor, or production plant efficiencies quickly reverberated through the system.
- Increasing demand for fungicides in other countries (e.g., India, China) has strained existing manufacturing capacity. One also wonders if manufacturing plants located in these countries might also be obligated to give domestic fungicide markets a higher priority than export markets? I do not know how many of the major fungicide manufacturing plants are located in China and India, but the numbers are not insignificant.
- Some factories in China were shut down during the 2008 Olympics as the Chinese government

CONTROL RUMOR?

EXPECT FUNGICIDE SUPPLY COMPLICATIONS FOR 2009
Dave Rosenberger
(Plant Pathology, Highland)

❖❖ Fruit growers will face some unusual challenges vis-à-vis fungicide programs for 2009. The challenges arise from huge changes in pricing for many products, limited availability for some products, and gamesmanship concerning how to obtain the most favorable pricing. Details of pricing always vary widely depending on many factors, so I will not attempt to offer any specifics on pricing. Furthermore, comments on seasonal availability of products often end up being more rumor-based than fact-based, and I'm certain that I have not yet heard all of the rumors. Nevertheless, I have attempted to summarize below some "information" that I have derived from various sources over the winter along with some conjecture on what is causing the current turmoil in the fungicide supply chain.

Fungicide availability: Dithane is not currently being produced because an old produc-

continued...

attempted to improve air quality. Those shutdowns may have affected seasonal availability for some fungicides because it can take many weeks to restart plants after a shutdown.

- The just-in-time production and delivery schemes that have been developed for various manufacturing industries are also being implemented to some extent in the agrichemical industry. Carrying large inventories has both economic and liability costs, so everyone from primary manufacturers to individual growers has apparently been cutting back on inventory holdings and counting on just-in-time delivery. The limitations of this supply concept will become painfully obvious if/when huge regions of the eastern United States encounter a long wet season that creates unexpected demands for abnormally large quantities of fungicides.

- Some strobilurin fungicides are now being applied to millions of acres of corn and soybeans as “plant health” products because they can generate yield increases in the absence of any single disease that would warrant fungicide application. This plant health usage has rocketed upward in the past three years and is creating competition for available supplies of the strobilurin fungicides found in Pristine and Quadris/Abound.

Suggested strategies for dealing with changes in fungicide markets: I can’t suggest any single strategy for dealing with changes, but it makes sense to review current pricing for various fungicides with your supplier. Changing costs may make it feasible to include more strobilurin sprays (Sovran, Flint) in prebloom scab control programs for growers who previously depended primarily on mancozeb and/or captan. However, each fungicide has its own strengths and weaknesses, so making wholesale changes without considering the implications could have adverse consequences. I will attempt to review some of these apple scab fungicide nuances in next week’s *Scaffolds*.

The bottom line is that growers may need to plan ahead a bit more this year in preparing for apple scab season. Despite increasing prices for fungicides, the most expensive fungicide program

will still be the one that fails to control early-season scab, thereby necessitating higher rates of captan throughout summer. Failed attempts to reduce fungicide expenses could ultimately prove to be the worst possible outcome from the ongoing changes in the fungicide market. ❖❖

HEAD
'EM OFF

ACT NOW TO REDUCE
SCAB INOCULUM IN
PROBLEM ORCHARDS
Dave Rosenberger (Plant
Pathology, Highland)

❖❖ The combination of scab-susceptible cultivars, a wet spring, and high levels of carry-over inoculum has been the traditional recipe for generating economic losses to apple scab. Apple growers cannot control the weather, and they presumably have good reasons for choosing the cultivars in their orchards. Therefore, the only variable that growers can control is the amount of carry-over scab inoculum that is present in the orchard.

For most of the past 30 years, we paid little attention to inoculum levels because dodine, Benlate, Topsin M, and then the SI fungicides (Rubigan, Nova, Procure) provided after-infection activity that could arrest apple scab epidemics if primary infections became established during a wet year. The SI fungicides can still perform that function in many orchards around the northeast, but resistance to the SIs has taken away the last scab control “backstop” in many other orchards. The strobilurin fungicides, Sovran and Flint, are not very effective for arresting scab epidemics after infections are established. The orchards where SIs are no longer working are often the same as those that have elevated inoculum levels. In these orchards, inoculum reduction should be considered a critical component of scab control.

continued...

Overwintering scab inoculum can be reduced either by applying a urea spray sometime before green tip or by shredding leaf litter with a flail mower. Urea works by stimulating microbial breakdown of over-wintering leaves and by softening leaves so that they can be removed more quickly by earthworms that feed on the leaf litter. Urea may also directly suppress ascospore formation in the surviving leaf litter. Shredding leaf litter with a flail mower causes leaves to decay more quickly and also reorients much of the leaf litter so that ascospores released from those reoriented leaf pieces will discharge into the ground rather than into the air. In a recent study in New Hampshire, Sutton et al. (2000) found that either of these sanitation measures (spring urea sprays or flail chopping leaves in spring) could reduce ascospore production by 70–80%.

When using urea for inoculum reduction, each acre of orchard should be sprayed with 40 lb of urea fertilizer dissolved in 100 gallons of water. It may be necessary to dissolve the urea prills in hot water before dumping them into a sprayer because the prills may dissolve slowly in icy water pumped from a pond. Applications should be made as soon as possible in the spring and preferably before green tip. However, urea applications made as late as green tip can still reduce the numbers of ascospores available during peak discharge periods between tight cluster and bloom. The urea spray can be applied either with air blast sprayers that have the upper nozzles turned off or with boom sprayers rigged to spray both the sodded row middles and the areas beneath the trees. Effectiveness of the spray will be largely dependent on achieving thorough coverage of the entire orchard floor. Spreading urea prills with a fertilizer spreader will NOT accomplish the same thing because the prills will not allow for uniform and thorough coverage of the leaf litter on the orchard floor.

Urea fertilizer contains 46% actual nitrogen in a highly soluble form. The portion of the urea spray that falls within the herbicide strip beneath the tree canopy (or inside the drip-line) will ulti-

mately contribute somewhat to nitrogen fertilization of the trees, whereas the portion of the spray that is applied to the sodded row middles will be utilized primarily by the ground cover. Nitrogen fertilizer rates should be adjusted accordingly for orchards where urea applications are used for scab control. Where the addition of nitrogen is undesirable for horticultural reasons, leaf shredding with a flail mower may be a better option. Using urea at less than 40 lb/A might have some effect on inoculum reduction, but benefits of lower rates of urea have not been adequately researched.

Effective leaf shredding can be accomplished only with a flail mower that is set low enough to contact leaf litter on the orchard floor. Rotary mowers generally will not be able to shred leaf litter that has been pressed to the ground by winter rains and snow cover. If the flail mower cannot be offset to reach most of area beneath trees, then leaf litter beneath trees should be blown or raked into the sodded row middles where it can be accessed with the flail mower. Mechanical brush rakes can remove leaf litter from beneath trees if the orchard has a relatively clean herbicide strip. Flail mowers used to chop prunings should shred leaf litter at the same time if the flails are adjusted to cut low enough. However, low flail mowing in early spring can remove most of the overwintering sod cover, thereby increasing potential problems with mud and equipment traction at the time when early fungicide sprays will need to be applied.

Using a urea spray or leaf shredding prior to bud break will not eliminate the need for protectant sprays beginning at green tip. Where SI resistance is suspected, extra care will still be required to ensure that trees are protected with mancozeb, Polyram, and/or captan ahead of rains. Sanitation measures that reduce overwintering inoculum levels are therefore a supplement to, not a replacement for, effective spray programs during the prebloom period.

continued...

Sanitation measures applied to high-inoculum orchards provide the following benefits:

1. Reducing inoculum reduces risks of getting green tip infections. These early infections begin sporulating as trees approach bloom, just at the time that terminal leaves and fruitlets are approaching peak susceptibility to scab. Only a small proportion of ascospores are usually mature enough for release at green tip, but that small proportion can still be a huge number in high-inoculum orchards. High-inoculum orchards subjected to urea sprays or leaf shredding will behave more like “normal” orchards vis-à-vis risks of green tip scab infections.

2. Protectant fungicides such as mancozeb and captan work better in low-inoculum than high-inoculum orchards, especially if foul weather prevents perfect spray timing.

3. Reducing inoculum reduces selection pressure for resistance to the strobilurin fungicides (Sovran, Flint) and the anilinopyrimidine fungicides (Vanguard, Scala) if those fungicides are used during the prebloom period.

Finally, it is worth noting that urea sprays or leaf chopping have no value in orchards that did not have apple scab last year. Thus, the need for inoculum reduction must be assessed on a block-by-block basis. (In orchards where scab was well controlled last year, most inoculum for this year will probably originate from external sources such as wild trees or homeowner trees.) Using a combination of inoculum reduction along with a tight schedule of protectant fungicides from green tip through petal fall should allow problem blocks to be cleaned up in a single year with no further need for urea sprays or leaf chopping until/unless another scab control failure occurs. ❖❖

Literature cited: Sutton, D.K., Mac Hardy, W.E., and Lord, W.G. 2000. Effects of shredding or treating apple leaf litter with urea on ascospore dose of *Venturia inaequalis* and disease buildup. *Plant Dis.* 84:1319-1326.

PU

ONE MORE
STINKIN' BUG
(Art Agnello,
Entomology, Geneva)

❖❖ Back in mid-February, Peter Jentsch reported the first collection of some specimens from a Hudson Valley homeowner of a new invasive pest species that has been on its way to our region since first being detected in the US in 2001 – the Brown Marmorated Stink Bug (*Halyomorpha halys*).



In the fall of 2001, this insect, which is native to Eastern Asia, was discovered in Allentown, PA. The insect is called a stink bug because of a noxious scent that is omitted if it is disturbed. Adults are able to fly and often enter homes in the late summer and early fall when they are seeking warm places to overwinter. The USDA is currently working to better understand this new invasive species. In Asia, the stink bug will feed on several agricultural plants, including apples, peaches, and soybeans; the USDA is therefore also concerned about the potential pest status of this insect. The immatures (nymphs) can be found on plants throughout the summer. These are similar to the adults in appearance, although the wings are not completely developed. Peter (among others) will be monitoring local orchards this season for evidence of its establishment in any tree fruit crops. ❖❖

PHENOLOGIES

Geneva, Highland: All dormant

PEST FOCUS

Highland:
Pear psylla egg laying
 has begun.

UPCOMING PEST EVENTS

	<u>43°F</u>	<u>50°F</u>
Current DD accumulations (Geneva 1/1–3/23/09):	48	13
(Geneva 1/1–3/23/2008):	43	16
(Geneva "Normal"):	44	16
(Highland 3/1–3/23/09):	59	16

<u>Coming Events:</u>	<u>Ranges (Normal ±StDev):</u>	
Green fruitworm 1st catch	58–130	16–58
Pear psylla adults active	31–99	8–34
Pear psylla 1st oviposition	40–126	11–53
McIntosh at silver tip	57–113	18–44

NOTE: Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide.

This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.